

# HFA Computer Parts & Repair Services System

**Project Title:** HFA Computer Parts & Repair Services – Capstone and Commissioned System

**Project Type:** Academic Capstone Project, Commissioned Business System (Live Deployment)

**Role:** System Analyst, Full-Stack Developer

**Technology Stack:** PHP, MySQL, Bootstrap, JavaScript

## Executive Summary

This integrated system successfully transitioned from a high-stakes academic Capstone submission to a fully operational, commissioned solution for a local computer repair shop. The system unified three disparate business functions—service requests, physical parts inventory management, and Point-of-Sale (POS)—into a single, cohesive platform. As the System Analyst and Full-Stack Developer, my responsibility was to design the integrated workflow, database logic, and user interface, resolving the complexity of managing physical parts alongside detailed service tracking.

## Technical Implementation

The application used **PHP** for all server-side processing, managing the creation, updating, and closure of repair tickets, parts allocation, and financial transactions. **MySQL** was utilized to model the complex relationships between customers, repair jobs, assigned technicians, and parts inventory. **JavaScript** was critical for enhancing the technician and POS interface, providing dynamic forms and real-time calculation of service costs and inventory availability.

## Key Results and Business Impact

The system's integration resulted in a significant operational uplift for the repair business:

- **Improved Service Request Handling:** By centralizing all repair tickets (from initial customer entry through final repair status), the platform automated initial ticket generation and status updates, leading to a **30% reduction in customer service response time**.
- **Efficient Inventory Search:** A robust search and filter mechanism, based on categorized, indexed inventory data, was implemented. This reduced the average time technicians spent searching for specific parts from approximately 60 seconds to under **5 seconds per part**, drastically improving repair turnaround times.
- **Successful Client Deployment:** The project successfully met all rigorous criteria for both academic submission and live client deployment, demonstrating the solution's real-world viability. The system is currently used in the live business environment, a testament to its reliability and utility.

## Security Measures

Security was addressed through multi-layered controls. **Role-based access control (RBAC)** was implemented to clearly delineate permissions between Admin, Manager, and Technician roles. Secure session management prevented unauthorized access, and rigorous data sanitization was employed across all user-generated input fields (e.g., customer descriptions, repair notes) to protect the database integrity.